



Tricks of the Trade

Any one who has purchased an Aerco Parallel Printer interface within the last couple of years received a bonus program on the back of the Printer Driver code tape. The program is Jack Dohany's Relocatable Aerco Print Driver.

This program provides Aerco printer driver code that can be located at any reasonable place in RAM with 800 bytes available. But did you know that you can use this code to print from within Omnicalc 2 for the Spectrum?

Setup your system with your Aerco interface, your Spectrum ROM and your printer. Load the Relocatable Print Driver. Answer the questions in the driver program for your printer, then turn on the code with a RAND USR 64000. Next, LOAD "om64000", the Omnicalc program that does not use memory above location 64000.

The LPRINT calls will now work as usual. But in addition to this you may now COPY a histogram screen to the printer via the Print Driver's COPY routine. To do this you must tell the Omnicalc program where the COPY routine starts, by using option G of function X. Function X will ask you for the "Address?" and you need to type in 64450.

Now when you enter the Graphics or Histogram mode of Omnicalc, you can copy the screen to your fullsize printer by pressing CS/9 (Caps Shift 9).

Since I do not have the 2068 version of Omnicalc, I can only assume that this method will also work for that version.

Thanks again to Mr. Dohany for his great little Print Driver.

Conference:

by vendors and users alike.

Many of us picked up some great software and hardware buys as well as plenty of information about all our Sinclair computers.

If you have never attended a conference, and you are heavy into Sinclairs, you can't afford to miss the next fest in your area, ask anyone who has been to one!

Yours Sinclairly, Mike.

Curry Computer Drops Spectrum Software

Curry Computer has stopped importing software titles for the ZX Spectrum and compatible computers. The move to no longer carry the software came when suppliers in England raised minimum orders to \$1000.

Due to a decrease in Spectrum title sales, Curry has decided to liquidate all of their remaining Spectrum stock at rock bottom prices. Curry has also acquired a number of TS1000 titles and is also liquidating them.

When asked about QL, 2068 and 1000 products, Curry said that they would continue to provide software and hardware as long as there are products to sell, and a market for those products.

In addition, Curry also plans to continue sales of Sinclair User magazine from England.

Curry Computer
P. O. Box 5607
Glendale, AZ 85312
1-602-978-2902
1-800-628-2828 #950
(orders only)

Midwest Sinclair Conference a Success

The 1988 Midwest Timex and Sinclair Conference held at the Beck Center for the Arts in Lakewood, OH was well received

See Conference, next column

NEW

REMINData

- A personalized calendar plotter & date reminder. ---
- > Prints a colorful calendar of any sequence of months (up to 12) for any year - past, present, or future.
- > Special dates may be entered as data & will be highlighted at the appropriate places on the calendar.
- > Each special date can have a short message associated with it and the message too will be printed.
- > The date/message data can be easily edited & added to.
- > Complete user notes included.

The calendar to the right is an actual size sample of what the utility program REMINDater can do. Please note how the special dates stand out and how the occasion associated with each special date is also printed. The sample is for one month only, but a whole year can be printed in one go. A calendar displaying no special dates can also be selected.

FEBRUARY

1988

SU	MO	TU	WE	TH	FR	SA
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29				

05 Cousin Chris's Birthday. (born '52)
18 Ron's/Brenda's Anniver. (married '83)
22 Ron's Birthday. (born '56)

NEW

DEMO-PAK 1

- An assortment of 15 plotter graphic demos. -----
- > The first of several planned 1520 "DEMO-PAKS".
- > Contains: FRACTAL PLOT, TURTLE PLOT, SIERPINSKI CURVE, and twelve examples from the 1520 User's Manual.
- > Both colorful "sit back & watch" graphics as well as some that require user input.
- > The BASIC prog. may be listed & studied for insights into how 1520 plot & print commands are used.
- > Complete user notes included.

The fractal plot to the left and the star pattern to the right are both actual plots made with DEMO-PAK 1 and a 1520.

ORDER YOURS NOW!!

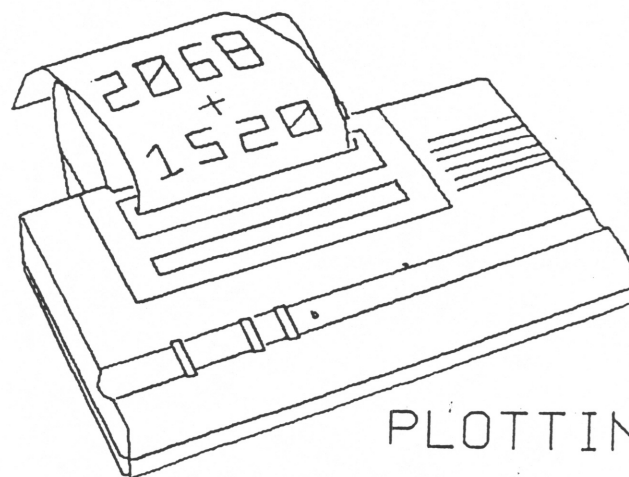
NAME: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

QUANTITY	DESCRIPTION	PRICE EACH	TOTAL
	Bare Board w/cassette	\$14.95 ppd	
	Complete Kit w/cassette	\$20.95 ppd	
	Assembled/tested w/cass.	\$30.95 ppd	
	Keyed Edge Connector-If purchased with hardware	\$4.95 ppd	
	SCREEN-TO-PLOTTER util.	\$8.95 ppd	
	STP EDITOR utility	\$8.95 ppd	
	PIC-PLOT utility	\$8.95 ppd	
	BANNERIFIC utility	\$8.95 ppd	
	CMS/1520 patch kit	\$8.95 ppd	
	DEMO-PAK 1 graphics +	\$8.95 ppd	
	REMINData utility	\$8.95 ppd	
	1520 PEN SET (4 COLORS)	\$2.00 ppd	

AFFORDABLE



PLOTTING

NOTE: This sample was done using SCREEN-TO-PLOTTER!

(Pre-paid orders only please.) TOTAL ENCLOSED>>>

SEND ALL ORDERS/INQUIRES TO:

John McMichael, 1710 Palmer Dr., Laramie, WY 82070

So, you've just spent big bucks for a super piece of software, made your back-up and are working away with your working copy. Suddenly, while you are working with a relatively unimportant utility program on another disk, your disk goes bad. That's not a major problem. You have a back-up somewhere, but it gets you to thinking about your back-ups on your commercial programs. What happens if they go bad? Should you have made them on some type of premium disks to guard against that?

You scour through catalogs and adds in magazines. There are sources galore for disks, at all prices, and some of them even have specifications. You run into one spec called 'clipping level' and the supplier claims that because his disks have been tested to a higher clipping level they are superior. Should you pay a premium for disks with superior specs? What do these specs mean? Will your back-ups be less likely to fail if you use premium disks?

These are difficult questions to answer. Perhaps an explanation of some of the tests run on disks and what can happen to your back-ups with time would help you make that decision. In addition, you may be interested in considering the cost tradeoffs of using premium disks.

As an engineer with many years of experience in magnetic recording I had never heard of the term 'clipping level' until it came up in a discussion on KAY*FOG. In fact, I had never seen a spec sheet in any box or bag (I buy the cheap stuff by mail order too) of disks I have bought. However, I spent a few years on a design team working on a Winchester Drive for personal computers. One of my jobs was the specification and testing of the disks used in the drives.

CLIPPING LEVEL: Since magnetic media is pretty much the same whether it's tape, disks, or hard disks (the major difference being the base material the magnetic particles is bonded to is mylar for tape and disks, and aluminum for the hard disks), it wasn't difficult for me to guess at what was meant by 'clipping level'. A little looking through a parts catalog and I found a specification on a chip designed for use in disk drives and they defined 'clipping level' (although in rather vague terms). It's unfortunate that these words are used to describe a test performed on disks since they have a different and more widely understood meaning throughout the general electronics industry. In any case we will have to accept these words since they are the ones used in the advertisements.

In simple terms, your drive uses a 'head' to read the information on the disk. You can think of this as being like the needle and pick-up on a phonograph. The head reads the magnetic information previously written on a disk and converts it into an electrical signal. This signal is further processed and eventually takes on a form suitable for transmission to your computer as bits, or bytes, which represents the data.

SIGNAL VARIATION: The size and shape of the electrical signal developed by the head varies for many reasons. First of all, it varies as a result of the information written on the disk, and this variation itself represents that information. However, there are other variations which take place due to imperfections in the head, the mechanical characteristics of the drive, or the imperfections in the disk. These variations, if large enough, will lead to the drive electronics not being able to correctly decode the information, and your computer will indicate this by means of some error message that it can't read the disk. It's therefore important to keep these variations (those not part of the data) at a minimum.

COATING THICKNESS: Magnetic disks or tapes are made by bonding magnetic particles to a flexible mylar backing material. Characteristics which affect the performance of the final product include, but not limited to, the magnetic nature of the particles, the size of the particles, (note: it's the modification of these 2 properties that make the difference between 1.2M disks and a 360K disk), the thickness of the coating, and, most important to the subject of 'clipping level', the uniformity of the coating. If a tiny part of the disk, the size of a pinhole, doesn't get coated, the signal level recoverable from that spot is reduced. Thus, if there are a number of these of sufficient size, the level of the signal will be fairly uniform until the 'pin-hole' passes under the head, at which point it will drop. The industry refers to these as 'drop-outs'. Furthermore, if the coating thickness varies over the surface of the disk, the amplitude of the signal can vary in a relatively smooth manner as the disk rotates. This is generally not a serious problem, however.

Your drive can recover data by separating disk related variations from the variations in signal due to the real data, provided that disk related variations are not too large. Typically a drive might be able to successfully ignore disk related variations which did not reduce the amplitude of the real signal to less than 30% of the normal output. This number, however, also depends on a wide variety of factors, and varies from drive to drive, even the same model by the same manufacturer.

Thus anything one could do to assure that the level of these disk related variations are held within a specified range should reduce the probability of errors. The key word is 'probability', and more will be said about this later. Therefore a disk which is tested to a 'clipping level' of 60% is tested to assure that the variations due to the disk are small enough that the signal level never drops below 60%. That is, the variations are held to a range between 60% and 100%. It follows that the higher the 'clipping level', the less variation in signal output and the reduced chance of a disk error. Now comes the tough part. How much extra money should you pay for a disk tested to a 60% level as compared to one tested to a 40% level? Would you pay 50% more? Twice as much? Ten times as much? The way I see it is this, there's a high probability that if I buy 25 or 50 brand X disks and they all work, whatever tests were run on them were probably sufficient to assure me that brand X disks will always work. I have no way of knowing what 'clipping level' disks destined for my drives should be tested at, nor, do I believe, do the manufacturers of floppy disks.

A WORD ABOUT HARD DISKS: In Winchester drives the situation is a little different. The manufacturers of the disks which go in these drives are generally different companies than those that make disk drives. The drive manufacturer imposes specifications on the disk maker. Furthermore, the drive manufacturer continually tests disks using sophisticated equipment to be sure that the disk maker meets these specs. That is, people who manufacture disks for use in hard drives do not sell them directly to the end user (removable hard disks being the exception).

BOTTOM LINE \$\$\$: But, back to floppies. Assume I buy 100 disks from each of two sources, SuperDisk for \$2.00 dollars each, and CheapDisk at \$.40 per. Finally, out of all the disks I bought, one SuperDisk and ten CheapDisks failed to format. I have ended up paying slightly over \$2.00/disk for the good SuperDisks, and about 45 cents each for the good CheapDisks. I still think I got a better buy on the CheapDisks.

MORE USE --- BETTER PERFORMANCE: What about disk failures in the future? That is as I use those 90 CheapDisks are they more likely to fail in the future than the 99 SuperDisks? Well, I suppose there are those who would argue with me that in fact they would. But I really don't believe it. The reason is that the first few times I use any disk its performance improves. The surface of the disk is left slightly rough because of the manufacturing process and this prevents good contact between the head and the disk. This poor contact degrades disk performance. As the disk is used and rotates past the head, the head knocks off some particles of the coating, smoothing the surface and improving the contact and the performance. In tape recording, in critical applications, new tape is never used without running it through a machine at least once and sometimes several times, just for this reason. Therefore, after I have used my CheapDisks several times I feel more comfortable with them than when they were brand new.

HOW LONG WILL THEY LAST: Finally, what about the really long term? Will CheapDisks retain the information stored on them equally as well as SuperDisks, say over a period of 100 years? Well, here we are dealing with real unknowns. There are no disks around that are a 100 years old. Magnetic recordings using media of the type used in disks is only about 40 years old. Archival data that has been around for long periods of time has turned out to be a problem in a number of fields. Ask a librarian about the problems facing the Library of Congress in protecting many of its books.

There has been some experience with magnetic recording in general that may be of interest. In tape, such as your audio or video cassettes, or computer tape as used on large main frames, there's a problem with long term storage known as 'print through'. The magnetic pattern on the tape representing the information emanates a magnetic field, just as the North and South poles do. This field is very minute, but still present, and any material susceptible to being magnetized will do so in the presence of a magnetic field. This is true even for weak fields

if the material is held still within the field for long periods of time. All tape is susceptible to being magnetized, that's its prime purpose in life. When wound on a reel, each piece of tape is tightly pressed against another one, and each piece emanates a field. If the tape is left untouched for several years, a little of the information recorded on each piece is transferred to mix with the information on the adjacent piece. In audio tapes one can hear this as low level background of the same music that played either a few seconds earlier or a few seconds later, particularly where a loud passage is immediately followed by a quiet one.

Normally disks have a jacket around them that is fairly thick. Thus it's unlikely that print through would take place between disks. On double sided disks however, the magnetic information on one side is pretty close to that on the other side, the distance being the same range as that previously discussed in the case of tape on a reel. If I were to make a guess at the first cause of long term failure, in the sense of not being able to recover 100% of the material from a floppy, I would guess that 'print through' would be the cause.

RE-COPY YOUR FLOPPIES: Someone once raised the question of whether it makes sense to re-copy masters of back-ups from time to time to make new back-ups. My initial reaction was that I didn't think it was worthwhile. Having given it some thought, however, it might not be a bad idea. If there's a degradation that takes place with time on an untouched back-up as it sits on the shelf, re-copying does in fact restore the information to a more pristine state and thus acts as added protection against the probability of losing your data. As to SuperDisks being any better than CheapDisks in an archival sense, I can think of no reason why there should be any difference, but perhaps we won't know that answer for another 100 years.

HOW COME SO CHEAP? There are a lot of reasons SuperDisks sell for more than CheapDisks. They spend more on advertising, or packaging, and possibly corporate headquarters. They sell primarily to companies, which avoid buying anything by mail order from some post office box across the country. And they sell at the price they do because people are willing to pay for it, whatever the reason. In fact, however, if you look into it you'll find that many of the people selling the cheaper disks are buying their raw goods from the same source as those selling the expensive versions. The whole thing about mass produced products, whether it's disks, drives, computers, or light bulbs, is that they are produced on a statistical basis. That is, costs are reduced to the point where the chance of a bad one getting to the user is acceptably low. This is simply good business. No company can stay in business if it strives for perfection in a commercial product line. Only governments can afford products which have been tested to the level of a space shuttle, and as we've found out, even they're not as perfect as needed. Personally I've always bought the least expensive disks I could find, furthermore, I buy single sided, single density disks and use them in double sided double density drives with no problems. On one occasion, I paid over \$25.00 for a box of 10 disks. It was a Sunday, I needed them, and they were the only ones I could find. One of the disks proved to be one of the few I ever ran into that was bad right out of the box.

One last comment on probabilities. If the odds of a given disk failing is 1 in 1,000 under whatever circumstances, the chance of 2 failing under the same circumstances is 1 in 1,000 times 1,000, or 1 in 1,000,000. Anyone for making 2 45 cent back-ups instead of 1 \$2.00 backup?

PS: I've taken some liberties in the preceding comments in the interests of keeping it from becoming overly technical but I don't believe these affect the substance of the arguments for purchasing lower cost disks. Also, I wasn't able to find detailed information on the testing of disks in the literature and much of the above is based on extending my experience from tape and hard disks to floppy disks. I'd appreciate it if anyone having more information on the subject, or finding inaccuracies within this tome contact me by mail at: P.O. Box 324, Redwood City, Ca. 94062